

PICTURE FRAME SCANNER**TECHNICAL FIELD**

[0001] The present invention generally relates to desktop digital image scanners for use by a computer and specifically to a picture frame scanner.

BACKGROUND

[0002] Existing scanners are generally handheld, sheet-fed or flatbed. Handheld scanners are held by a user and passed over a document, photo or other media to digitally scan its image. The image quality of a scan performed with a handheld scanner is largely dependent on the steadiness and alignment of the scan pass. Sheet-fed scanners are generally integrated into another device, such as a fax machine; scanning for output to a personal computer or similar device is a secondary function. The quality of images associated with a sheet-fed scanner is largely dependent on the ability of the feed mechanism to handle the article being scanned.

[0003] As relatively high resolution flatbed scanners have grown in popularity, handheld scanners have become largely obsolete, while sheet-fed scanners are relegated to the aforementioned secondary role. Existing flatbed scanners are configured similar to a copier. A document cover lid is opened, the item or media to be scanned is placed face down on a document glass or platen and a mechanism disposed beneath the glass is activated to scan a digital image of the media. Typically a document cover is closed over the document, photo or other media to hold the media in place and to shut out ambient light. Necessarily a flatbed scanner has a large "footprint" as it must accommodate a document laid flat.

[0004] Computer software, e-mail and Internet traffic have become image intensive. Therefore, the use of scanners has become more prevalent. As scanner technology moves to the desktop, several barriers arise. First, the footprint or the size of the scanning device is not

compatible with the fairly well occupied desktop. Hence, potential scanner users must consider the tradeoffs associated with incorporating a new bulky piece of equipment into their computing environment. To address the relatively large footprint of existing flatbed scanners, scaled down versions of scanners, sized to take a four inch by six inch photograph or similar items, have been introduced. These smaller existing scanners have the typical horizontal flatbed architecture or configuration, accepting an item or photograph face down for scanning. Therefore, these smaller flatbed scanner still possess a cumbersome footprint. Additionally, the flatbed scanner is a utilitarian product, it has no function beyond that of scanning images.

SUMMARY OF THE INVENTION

[0005] A picture frame scanner has a frame defining a display area. The frame is disposed generally upright. A transparent retention pane is mounted within the frame, spanning the display area. A support back spanning the display area is spaced apart from the retention pane. An image scanning bar is operatively mounted in the frame for moving across the display area and scanning an electronic image of media disposed between the support back and the retention pane into memory storage.

BRIEF DESCRIPTION OF THE DRAWING

[0006] FIGURE 1 is a perspective view of a preferred embodiment scanner according to the present invention, disposed in a landscape orientation;

[0007] FIGURE 1A is a perspective view of an alternative embodiment scanner according to the present invention;

[0008] FIGURE 2 is a front elevation view of the scanner of FIGURE 1;

[0009] FIGURE 2A is a perspective view of an alternative embodiment scanner according to the present invention with a document cover disposed over the display area;

[0010] FIGURE 3 is a rear elevational view of the scanner of FIGURE 1;

[0011] FIGURE 4 is a top plan view of the scanner of FIGURE 1;

[0012] FIGURE 5 is a bottom plan view of the scanner of FIGURE 1;

[0013] FIGURE 5A is a bottom plan view of the scanner of FIGURE 1A;

[0014] FIGURE 6 is an end elevational view of the scanner of FIGURE 1;

[0015] FIGURE 6A is an end elevational view of the scanner of FIGURE 2A;

[0016] FIGURE 7 is an opposite end elevational view of the scanner of FIGURE 1;

and

[0017] FIGURE 8 is a perspective view of the scanner of FIGURE 1 according to the present invention, disposed in a portrait orientation.

DETAILED DESCRIPTION

[0018] Present picture frame scanner 100 provides multiple functionality. When picture frame scanner 100 is not being used to scan, it preferably displays a photograph or similar planar media while sitting on a desktop, counter top, bookshelf, television set top or other surface, available for viewing.

[0019] Turning to the FIGURES, a preferred embodiment of the present invention, picture frame scanner 100, is shown. Picture frame scanner 100 is preferably a contact image sensor (CIS) based digital image scanning device that takes the form of a picture frame. Picture frame scanner 100 sits generally upright on a desktop or a similar surface, slightly tilted back. Turning specifically to FIGURES 1 and 2, picture frame scanner 100 has a frame 101 that defines display area 102. Generally transparent display glass 103 is mounted within

frame 101 and spans display area 102. Turning to FIGURE 3, support back 301 spans display area 102, behind frame 101. Retention pane 305 spans the display area adjacent to support back 301 within frame 101 and spaced apart from display glass 103. Preferably, media reception slot 401 is defined between support back 301 and retention pane 305 by frame 101, as best seen in FIGURE 4. Access opening 302 is preferably defined in support back 301 to facilitate removal and repositioning of a photograph or a similar medium inserted into the scanner, via slot 401. Image scanning bar 104 preferably employs a contact image sensor head. Image scanning bar 104 is operatively mounted in frame 101, preferably between retention pane 305 and display glass 103. During scanning, scanning head 104 moves across display area 102, scanning a photograph or other media disposed between support back 301 and retention pane 305 into internal scanner memory or into remote memory or mass storage. Such remote storage may be associated with a personal computer, set-top box device, an electronic image viewing system or the like connected to scanner 100.

[0020] Preferably, as illustrated in FIGURES 1 and 8, frame 101 is disposed generally upright, preferably tilted back at a slight angle, preferably in the range of 10 to 20 degrees. Beneficially, this provides the desired smaller footprint. As a result of the slight tilt, support back 301 is disposed at a generally acute angle relative to a supporting surface. Thus configured, the scanner functions as, and takes the form of, a picture frame when holding a photograph. So in a singular embodiment, both the footprint problem of a conventional scanner and the added value desired are addressed.

[0021] A preferred embodiment of picture frame scanner 100 may be positioned in either a horizontal, landscape picture frame mode, as illustrated in FIGURE 1; or in a vertical, portrait picture frame mode, as illustrated in FIGURE 8. This facilitates display of either a landscape or portrait photograph or similar media. Deployed in the portrait mode, this embodiment provides an even smaller footprint. Stand 106 extends rearward from a lower corner of frame 101. Preferably stand 106 takes a truncated pyramidal form extending generally horizontal. Thus, as seen in FIGURE 1, angled bottom 107 of stand 106 supports

scanner 100 in a horizontal or landscape orientation. While in a vertical or portrait orientation, angled side 108 supports scanner frame 101, as shown in FIGURE 8. Alternatively, as shown in FIGURES 1A and 5A, support 109 may extend from the lower and one side edge of scanner 100, to support scanner 100 in both landscape and portrait orientations. Another alternative embodiment calls for scanner 100 to be supported in either the landscape or portrait modes by a separate stand.

[0022] Scanning head bar 104 preferably incorporates a mechanism to move the scanning head across display area 102 during scanning. Also, scanning bar 104 preferably incorporates a light into its configuration. The light moves with scanning bar 104 to provide illumination needed to scan the photograph or other medium. The bulk of the electronic circuitry associated with scanner 100 is preferably mounted on the scanning head bar 104 in the form of a CIS. However, additional components may be deployed in the periphery of frame 101 or in stand 106. Scanning head 104 is preferably mounted between display glass 103 and retention pane 305 to protect the scanning and movement mechanism from dust and debris. Also, the preferred CIS bar has a low profile configuration. This allows the frame around the displayed photograph to have a minimum height, avoiding a "tunnel" effect when viewing a picture disposed in picture frame scanner 100, facilitating the picture frame function of the present invention.

[0023] A number of control buttons are preferably incorporated into frame 101. Alternatively, the buttons may be mounted on the back of frame 101, out of sight for display purposes. Buttons 105 may carry out several functions such as scanning, power, standby or rotation. The scanning button may take different forms, such as separate scanning buttons for scanning to a computer, set-top box or other electronic image viewing system and a button that scans immediately to an e-mail attachment. A rotate button allows a user to rotate a scanned image from landscape to portrait orientation. Alternatively, control of the scanner may be carried out from an attached device such as a computer or set top box, eliminating the need for buttons on the scanner itself. A further alternative embodiment of the present

invention incorporates wireless remote control of scanning operation and rotation for convenient use with set-top box based e-mail or Internet browser systems.

[0024] One embodiment calls for automatically rotating the scanned image in response to a sensor or sensors deployed in frame 101. Such sensors automatically detect the orientation of entire picture frame scanner 100 and adjust the orientation of the scanner output for properly oriented presentation on a personal computer or an electronic image viewing system, eliminating the need for a rotate button.

[0025] Regardless, picture frame scanner 100 preferably simplifies proper orientation of scanned images by providing a guide. If the photo or other object is placed in the scanner for proper viewing the output image will be in the proper orientation, not upside down, and the rotate button or sensors will provide the proper upright orientation.

[0026] Turning to FIGURE 3, as illustrated, an input/output port 303, such as a universal serial bus (USB) connector is disposed on the back of the picture frame scanner 100. Preferably, port 303 is disposed in the rear of stand 106 as illustrated in FIGURE 3, and preferably port 303 offers both I/O capability and power to scanner 100. Hence, preferably a single cable comes into one common corner of the back of scanner 100 in such a manner that the cord lays on the supporting surface when the frame is disposed in either the portrait or landscape orientation. Alternatively, a power supply cord from a transformer is plugged into alternative power input 304.

[0027] Picture frame scanner 100 is particularly well adapted to facilitate sharing photographs with friends and family. In operation, a user conveniently slides the photograph or other medium to be scanned into picture frame scanner 100, facing outward, from the top of the scanner. The item is automatically seated into the correct position. Alternatively, a portion of frame 101 may hinge forward to provide more direct access when placing a photograph or other planar item in picture frame scanner 100. Then this mechanism is rotated back, aligning the item for scanning. Preferably, the picture frame scanner may scan in both

orientations. The user initiates scanning by pressing one of buttons 105 or through software running on a computer or similar device connected to scanner 100. A digital image of the media disposed in scanner 100 is scanned to memory storage housed in scanner 100 or in the computer or similar device connected to scanner 100.

[0028] Alternatively, a portion of frame 101 may accommodate a snap fit cover. Such snap fit covers could employ a wood-like or colored finish. This alternative embodiment may be carried out by a cover or a snap fit alternative to frame 101. In such an alternative embodiment, an underlying frame part may accept the alternative frame face or cover.

[0029] If ambient light is an issue for scanning, another alternative embodiment illustrated in FIGURES 2A and 6A has a document cover 201 that may be attached to frame 101 via hinge 202. Cover 201 is preferably hinged to frame 101 to flip over from the back of frame 101 in preparation for scanning. Hinge 202 is shown as a two-part hinge with first hinges 203 hinging cover 201 to hinge plate 204 that is, in turn, hinged to frame 101 by second hinges 602.

[0030] A further alternative method to deal with ambient light is treating display glass 103 in various manners. By way of example, polarized glass may be used for display glass 103. Ambient light generally comes from the top of picture frame scanner 100. Polarized glass may be used to shield the photograph from a portion of the light coming from a particular angle, such as from above picture frame scanner 100. Alternatively, an electrically opaquing glass may be employed as display glass 103, activated by initiation of the scanning process.

[0031] Another alternative embodiment of the present invention employs a liquid crystal display (LCD) as support back 301. The LCD is adapted to display electronic images through display glass 103 when an item is not being displayed. A support back in the form of an LCD should not include an access opening as illustrated. The display images are

preferably images scanned by picture frame scanner 100 and stored in memory disposed within the picture frame scanner. However, images may originate from a computer connected to picture frame scanner 100, via port 303.

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